Lesson 10.4 • Counting Techniques

Name _____ **Period** _____ **Date** _____

1. Identify each situation as a permutation, a combination, or neither.

a. The number of three-person committees that can be selected from a class of 15 students

b. The number of different four-digit numbers that can be made from the digits 2, 6, 7, and 9

c. The number of paths, moving only right or down along side segments, for getting from the upper-left corner of a checker board to the bottom-right corner

d. The number of different outcomes of selecting five balls from a bag containing six red balls and seven white balls

2. Evaluate each number of permutations or combinations without using your calculator. Show your calculations.

a. ${}_6P_3$ **b.** ${}_6C_3$ **c.** ${}_6P_1$ **d.** ${}_6C_1$

3. The San Benito Boys and Girls Club basketball coach has seven players dressed for a game.

a. In how many ways can they be arranged to sit on the bench?

b. Five players are assigned to specific positions for the game. How many different teams can the coach put on the floor?

c. If there is a tie after regulation time, four players each take five free throws and the team with the highest total wins. How many possibilities does the coach have for selecting who will break a tie?

4. Ricardo has six books written by five different authors. In how many ways can he arrange them on a shelf so that the two books by the same author are next to each other?

5. In the Boys and Girls Club Basketball Fundraising Lottery, participants buy a ticket containing four different numbers from 0 to 9. Each week, a winner is determined by drawing four numbers from a hat containing the ten one-digit choices. Any person who has a ticket with three of the four correct digits is a winner.

a. How many different tickets is it possible to buy?

b. How many winning possibilities are there each week?

c. If you buy one ticket, what is your probability of winning?